SEQUENCE LISTING

<110> BEAUDOIN, Adrien R.
      SÉVIGNY, Jean
      BACH, Fritz H.
      ROBSON, Simon

<120> ATP-DIPHOSPHOHYDROLASES, PROCESS OF PURIFICATION
      THEREOF AND PROCESS OF PRODUCING THEREOF BY RECOMBINANT
      TECHNOLOGY

<130> 920333.90019

<140> 09/781,796
<141> 2001-02-12

<150> 08/419,204
<151> 1995-04-10

<150> CA96/00223
<151> 1996-04-10

<150> 08/930,921
<151> 1998-02-01

<160> 8

<170> PatentIn Ver. 2.1

<210> 1
<211> 510
<212> PRT
<213> Homo sapiens

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Met Glu Asp Thr Lys Glu Ser Asn Val Lys Thr Phe Cys Ser Lys Asn
 1   5   10   15

Ile Leu Ala Ile Leu Gly Phe Ser Ser Ile Ile Ala Val Ile Ala Leu
            20   25   30

Leu Ala Val Gly Leu Thr Gln Asn Lys Ala Leu Pro Glu Asn Val Lys
        35   40   45

Tyr Gly Ile Val Leu Asp Ala Gly Ser Ser His Thr Ser Leu Tyr Ile
    50   55   60

Tyr Lys Trp Pro Ala Glu Lys Glu Asn Asp Thr Gly Val Val His Gln

          65   70   75   80

Val Glu Glu Cys Arg Val Lys Gly Pro Gly Ile Ser Lys Phe Val Gln
                        85   90   95

Lys Val Asn Glu Ile Gly Ile Tyr Leu Thr Asp Cys Met Glu Arg Ala
                  100   105   110

Arg Glu Val Ile Pro Arg Ser Gln His Gln Glu Thr Pro Val Tyr Leu
                  115   120   125

Gly Ala Thr Ala Gly Met Arg Leu Leu Arg Met Glu Ser Glu Glu Leu
      130   135   140

Ala Asp Arg Val Leu Asp Val Val Glu Arg Ser Leu Ser Asn Tyr Pro
145   150   155   160

Phe Asp Phe Gln Gly Ala Arg Ile Ile Thr Gly Gln Glu Glu Gly Ala
                  165   170   175

Tyr Gly Trp Ile Thr Ile Asn Tyr Leu Leu Gly Lys Phe Ser Gln Lys
                  180   185   190

Thr Arg Trp Phe Ser Ile Val Pro Tyr Glu Thr Asn Asn Gln Glu Thr
            195   200   205

Phe Gly Ala Leu Asp Leu Gly Gly Ala Ser Thr Gln Val Thr Phe Val
      210   215   220

Pro Gln Asn Gln Thr Ile Glu Ser Pro Asp Asn Ala Leu Gln Phe Arg
225   230   235   240

Leu Tyr Gly Lys Asp Tyr Asn Val Tyr Thr His Ser Phe Leu Cys Tyr
                  245   250   255

Gly Lys Asp Gln Ala Leu Trp Gln Lys Leu Ala Lys Asp Ile Gln Val
                  260   265   270

Ala Ser Asn Glu Ile Leu Arg Asp Pro Cys Phe His Pro Gly Tyr Lys
                  275   280   285

Lys Val Val Asn Val Ser Asp Leu Tyr Lys Thr Pro Cys Thr Lys Arg
                  290   295   300

Phe Glu Met Thr Leu Pro Phe Gln Gln Phe Glu Ile Gln Gly Ile Gly
305   310   315   320

Asn Tyr Gln Gln Cys His Gln Ser Ile Leu Glu Leu Phe Asn Thr Ser

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Tyr Cys Pro Tyr Ser Gln Cys Ala Phe Asn Gly Ile Phe Leu Pro Pro
                340                 345                 350

Leu Gln Gly Asp Phe Gly Ala Phe Ser Ala Phe Tyr Phe Val Met Lys
                355                 360                 365

Phe Leu Asn Leu Thr Ser Glu Lys Val Ser Gln Glu Lys Val Thr Glu
    370                 375                 380

Met Met Lys Lys Phe Cys Ala Gln Pro Trp Glu Glu Ile Lys Thr Ser
385                 390                 395                 400

Tyr Ala Gly Val Lys Glu Lys Tyr Leu Ser Glu Tyr Cys Phe Ser Gly
                405                 410                 415

Thr Tyr Ile Leu Ser Leu Leu Leu Gln Gly Tyr His Phe Thr Ala Asp
                420                 425                 430

Ser Trp Glu His Ile His Phe Ile Gly Lys Ile Gln Gly Ser Asp Ala
                435                 440                 445

Gly Trp Thr Leu Gly Tyr Met Leu Asn Leu Thr Asn Met Ile Pro Ala
                450                 455                 460

Glu Gln Pro Leu Ser Thr Pro Leu Ser His Ser Thr Tyr Val Phe Leu
465                 470                 475                 480

Met Val Leu Phe Ser Leu Val Leu Phe Thr Val Ala Ile Ile Gly Leu
                485                 490                 495

Leu Ile Phe His Lys Pro Ser Tyr Phe Trp Lys Asp Met Val
                500                 505                 510


<210> 2
<211> 1818
<212> PRT
<213> Homo sapiens

<400> 2
Ala Cys Cys Ala Cys Ala Cys Cys Ala Ala Gly Cys Ala Gly Cys Gly
1               5               10                  15

Gly Cys Thr Gly Gly Gly Gly Gly Gly Gly Gly Gly Ala Ala Ala Gly
            20                  25                  30
```

3

Ala Cys Gly Ala Gly Gly Ala Ala Ala Gly Ala Gly Gly Ala Gly Gly
         35   40   45

Ala Ala Ala Ala Cys Ala Ala Ala Ala Gly Cys Thr Gly Cys Thr Ala
         50   55   60

Cys Thr Thr Ala Thr Gly Gly Ala Ala Gly Ala Thr Ala Cys Ala Ala
65   70   75   80

Ala Gly Gly Ala Gly Thr Cys Thr Ala Ala Cys Gly Thr Gly Ala Ala
                  85   90   95

Gly Ala Cys Ala Thr Thr Thr Thr Gly Cys Thr Cys Cys Ala Ala Gly
                  100   105   110

Ala Ala Thr Ala Thr Cys Cys Thr Ala Gly Cys Cys Ala Thr Cys Cys
         115   120   125

Thr Thr Gly Gly Cys Thr Thr Cys Thr Cys Cys Thr Cys Thr Ala Thr
         130   135   140

Cys Ala Thr Ala Gly Cys Thr Gly Thr Gly Ala Thr Ala Gly Cys Thr
145   150   155   160

Thr Thr Gly Cys Thr Thr Gly Cys Thr Gly Thr Gly Gly Gly Gly Thr
                  165   170   175

Thr Gly Ala Cys Cys Cys Ala Gly Ala Ala Cys Ala Ala Ala Gly Cys
                  180   185   190

Ala Thr Thr Gly Cys Cys Ala Gly Ala Ala Ala Ala Cys Gly Thr Thr
         195   200   205

Ala Ala Gly Thr Ala Thr Gly Gly Gly Ala Thr Thr Gly Thr Gly Cys
         210   215   220

Thr Gly Gly Ala Thr Gly Cys Gly Gly Gly Thr Thr Cys Thr Thr Cys
225   230   235   240

Thr Cys Ala Cys Ala Cys Ala Ala Gly Thr Thr Thr Ala Thr Ala Cys
                  245   250   255

Ala Thr Cys Thr Ala Thr Ala Ala Gly Thr Gly Gly Cys Cys Ala Gly
                  260   265   270

Cys Ala Gly Ala Ala Ala Ala Gly Gly Ala Gly Ala Ala Thr Gly Ala
         275   280   285

Cys Ala Cys Ala Gly Gly Cys Gly Thr Gly Gly Thr Gly Cys Ala Thr
290   295   300

Cys Ala Ala Gly Thr Ala Gly Ala Ala Gly Ala Ala Thr Gly Cys Ala
305   310   315   320

Gly Gly Gly Thr Thr Ala Ala Ala Gly Gly Thr Cys Cys Thr Gly Gly
                325   330   335

Ala Ala Thr Cys Thr Cys Ala Ala Ala Ala Thr Thr Thr Gly Thr Thr
            340   345   350

Cys Ala Gly Ala Ala Ala Gly Thr Ala Ala Ala Thr Gly Ala Ala Ala
            355   360   365

Thr Ala Gly Gly Cys Ala Thr Thr Thr Ala Cys Cys Thr Gly Ala Cys
    370   375   380

Thr Gly Ala Thr Thr Gly Cys Ala Thr Gly Gly Ala Ala Ala Gly Ala
385   390   395   400

Gly Cys Thr Ala Gly Gly Gly Ala Ala Gly Thr Gly Ala Thr Thr Cys
                405   410   415

Cys Ala Ala Gly Gly Thr Cys Cys Cys Ala Gly Cys Ala Cys Cys Ala
            420   425   430

Ala Gly Ala Gly Ala Cys Ala Cys Cys Cys Gly Thr Thr Thr Ala Cys
        435   440   445

Cys Thr Gly Gly Gly Ala Gly Cys Cys Ala Cys Gly Gly Cys Ala Gly
    450   455   460

Gly Cys Ala Thr Gly Cys Gly Gly Thr Thr Gly Cys Thr Cys Ala Gly
465   470   475   480

Gly Ala Thr Gly Gly Ala Ala Ala Gly Thr Gly Ala Ala Gly Ala Gly
                485   490   495

Thr Thr Gly Gly Cys Ala Gly Ala Cys Ala Gly Gly Gly Thr Thr Cys
            500   505   510

Thr Gly Gly Ala Thr Gly Thr Gly Gly Thr Gly Gly Ala Gly Ala Gly
        515   520   525

Gly Ala Gly Cys Cys Thr Cys Ala Gly Cys Ala Ala Cys Thr Ala Cys
530   535   540

Cys Cys Cys Thr Thr Thr Gly Ala Cys Thr Thr Cys Cys Ala Gly Gly
.545   550   555   560

Gly Thr Gly Cys Cys Ala Gly Gly Ala Thr Cys Ala Thr Thr Ala Cys
             565   570   575

Thr Gly Gly Cys Cys Ala Ala Gly Ala Gly Gly Ala Ala Gly Gly Thr
         580   585   590

Gly Cys Cys Thr Ala Thr Gly Gly Cys Thr Gly Gly Ala Thr Thr Ala
         595   600   605

Cys Thr Ala Thr Cys Ala Ala Cys Thr Ala Thr Cys Thr Gly Cys Thr
     610   615   620

Gly Gly Gly Cys Ala Ala Ala Thr Thr Cys Ala Gly Thr Cys Ala Gly
625   630   635   640

Ala Ala Ala Ala Cys Ala Ala Gly Gly Thr Gly Gly Thr Thr Cys Ala
                 645   650   655

Gly Cys Ala Thr Ala Gly Thr Cys Cys Cys Ala Thr Ala Thr Gly Ala
         660   665   670

Ala Ala Cys Cys Ala Ala Thr Ala Ala Thr Cys Ala Gly Gly Ala Ala
         675   680   685

Ala Cys Cys Thr Thr Thr Gly Gly Ala Gly Cys Thr Thr Thr Gly Gly
         690   695   700

Ala Cys Cys Thr Thr Gly Gly Gly Gly Gly Ala Gly Cys Cys Thr Cys
705   710   715   720

Thr Ala Cys Ala Cys Ala Ala Gly Thr Cys Ala Cys Thr Thr Thr Thr
             725   730   735

Gly Thr Ala Cys Cys Cys Cys Ala Ala Ala Ala Cys Cys Ala Gly Ala
         740   745   750

Cys Thr Ala Thr Cys Gly Ala Gly Thr Cys Cys Cys Cys Ala Gly Ala
     755   760   765

Thr Ala Ala Thr Gly Cys Thr Cys Thr Gly Cys Ala Ala Thr Thr Thr
     770   775   780

Cys Gly Cys Cys Thr Cys Thr Ala Thr Gly Gly Cys Ala Ala Gly Gly
785   790   795   800

Ala Cys Thr Ala Cys Ala Ala Thr Gly Thr Cys Thr Ala Cys Ala Cys
        805   810   815

Ala Cys Ala Thr Ala Gly Cys Thr Thr Cys Thr Thr Gly Thr Gly Cys
        820   825   830

Thr Ala Thr Gly Gly Gly Ala Ala Gly Gly Ala Thr Cys Ala Gly Gly
        835   840   845

Cys Ala Cys Thr Cys Thr Gly Gly Cys Ala Gly Ala Ala Ala Cys Thr
        850   855   860

Gly Gly Cys Cys Ala Ala Gly Gly Ala Cys Ala Thr Thr Cys Ala Gly
865   870   875   880

Gly Thr Thr Gly Cys Ala Ala Gly Thr Ala Ala Thr Gly Ala Ala Ala
            885   890   895

Thr Thr Cys Thr Cys Ala Gly Gly Gly Ala Cys Cys Cys Ala Thr Gly
            900   905   910

Cys Thr Thr Thr Cys Ala Thr Cys Cys Thr Gly Gly Ala Thr Ala Thr
            915   920   925

Ala Ala Gly Ala Ala Gly Gly Thr Ala Gly Thr Gly Ala Ala Cys Gly
    930   935   940

Thr Ala Ala Gly Thr Gly Ala Cys Cys Thr Thr Thr Ala Cys Ala Ala
945   950   955   960

Gly Ala Cys Cys Cys Cys Cys Thr Gly Cys Ala Cys Cys Ala Ala Gly
            965   970   975

Ala Gly Ala Thr Thr Thr Gly Ala Gly Ala Thr Gly Ala Cys Thr Cys
            980   985   990

Thr Thr Cys Cys Ala Thr Thr Cys Cys Ala Gly Cys Ala Gly Thr Thr
        995   1000   1005

Thr Gly Ala Ala Ala Thr Cys Cys Ala Gly Gly Gly Thr Ala Thr Thr
    1010   1015   1020

Gly Gly Ala Ala Ala Cys Thr Ala Thr Cys Ala Ala Cys Ala Ala Thr
1025   1030   1035   1040

Gly Cys Cys Ala Thr Cys Ala Ala Ala Gly Cys Ala Thr Cys Cys Thr
        1045   1050   1055

Gly Gly Ala Gly Cys Thr Cys Thr Thr Cys Ala Ala Cys Ala Cys Cys
        1060   1065   1070

Ala Gly Thr Thr Ala Cys Thr Gly Cys Cys Cys Thr Thr Ala Cys Thr
      1075   1080   1085

Cys Cys Cys Ala Gly Thr Gly Thr Gly Cys Cys Thr Thr Cys Ala Ala
      1090   1095   1100

Thr Gly Gly Gly Ala Thr Thr Thr Thr Cys Thr Thr Gly Cys Cys Ala
1105   1110   1115   1120

Cys Cys Ala Cys Thr Cys Cys Ala Gly Gly Gly Gly Gly Ala Thr Thr
          1125   1130   1135

Thr Thr Gly Gly Gly Gly Cys Ala Thr Thr Thr Cys Ala Gly Cys
      1140   1145   1150

Thr Thr Thr Thr Thr Ala Cys Thr Thr Thr Gly Thr Gly Ala Thr Gly
          1155   1160   1165

Ala Ala Gly Thr Thr Thr Thr Thr Ala Ala Ala Cys Thr Thr Gly Ala
      1170   1175   1180

Cys Ala Thr Cys Ala Gly Ala Gly Ala Ala Ala Gly Thr Cys Thr Cys
1185   1190   1195   1200

Thr Cys Ala Gly Gly Ala Ala Ala Ala Gly Gly Thr Gly Ala Cys Thr
          1205   1210   1215

Gly Ala Gly Ala Thr Gly Ala Thr Gly Ala Ala Ala Ala Ala Gly Thr
      1220   1225   1230

Thr Cys Thr Gly Thr Gly Cys Thr Cys Ala Gly Cys Cys Thr Thr Gly
      1235   1240   1245

Gly Gly Ala Gly Gly Ala Gly Ala Thr Ala Ala Ala Ala Ala Cys Ala
      1250   1255   1260

Thr Cys Thr Thr Ala Cys Gly Cys Thr Gly Gly Ala Gly Thr Ala Ala
1265   1270   1275   1280

Ala Gly Gly Ala Gly Ala Ala Gly Thr Ala Cys Cys Thr Gly Ala Gly
          1285   1290   1295

Thr Gly Ala Ala Thr Ala Cys Thr Gly Cys Thr Thr Thr Thr Cys Thr
      1300   1305   1310

Gly Gly Thr Ala Cys Cys Thr Ala Cys Ala Thr Thr Cys Thr Cys Thr
     1315   1320   1325

Cys Cys Cys Thr Cys Cys Thr Thr Cys Thr Gly Cys Ala Ala Gly Gly
     1330   1335   1340

Cys Thr Ala Thr Cys Ala Thr Thr Thr Cys Ala Cys Ala Gly Cys Thr
1345   1350   1355   1360

Gly Ala Thr Thr Cys Cys Thr Gly Gly Gly Ala Gly Cys Ala Cys Ala
         1365   1370   1375

Thr Cys Cys Ala Thr Thr Thr Cys Ala Thr Thr Gly Gly Cys Ala Ala
         1380   1385   1390

Gly Ala Thr Cys Cys Ala Gly Gly Gly Cys Ala Gly Cys Gly Ala Cys
         1395   1400   1405

Gly Cys Cys Gly Gly Cys Thr Gly Gly Ala Cys Thr Thr Thr Gly Gly
     1410   1415   1420

Gly Cys Thr Ala Cys Ala Thr Gly Cys Thr Gly Ala Ala Cys Cys Thr
1425   1430   1435   1440

Gly Ala Cys Cys Ala Ala Cys Ala Thr Gly Ala Thr Cys Cys Cys Ala
         1445   1450   1455

Gly Cys Thr Gly Ala Gly Cys Ala Ala Cys Cys Ala Thr Thr Gly Thr
         1460   1465   1470

Cys Cys Ala Cys Ala Cys Cys Thr Cys Thr Cys Thr Cys Cys Cys Ala
         1475   1480   1485

Cys Thr Cys Cys Ala Cys Cys Thr Ala Thr Gly Thr Cys Thr Thr Cys
     1490   1495   1500

Cys Thr Cys Ala Thr Gly Gly Thr Thr Cys Thr Ala Thr Thr Cys Thr
1505   1510   1515   1520

Cys Cys Cys Thr Gly Gly Thr Cys Cys Thr Thr Thr Cys Ala Cys
         1525   1530   1535

Ala Gly Thr Gly Gly Cys Cys Ala Thr Cys Ala Thr Ala Gly Gly Cys
     1540   1545   1550

Thr Thr Gly Cys Thr Thr Ala Thr Cys Thr Thr Thr Cys Ala Cys Ala
     1555   1560   1565

q

Ala Gly Cys Cys Thr Thr Cys Ala Thr Ala Thr Thr Thr Cys Thr Gly
1570   1575   1580

Gly Ala Ala Ala Gly Ala Thr Ala Thr Gly Gly Thr Ala Thr Ala Gly
1585   1590   1595   1600

Cys Ala Ala Ala Ala Gly Cys Ala Gly Cys Thr Gly Ala Ala Ala Thr
           1605   1610   1615

Ala Thr Gly Cys Thr Gly Gly Cys Thr Gly Gly Ala Gly Thr Gly Ala
          1620   1625   1630

Gly Gly Ala Ala Ala Ala Ala Ala Thr Cys Gly Thr Cys Cys Ala Gly
        1635   1640   1645

Gly Gly Ala Gly Cys Ala Thr Thr Thr Thr Cys Cys Thr Cys Cys Ala
       1650   1655   1660

Thr Cys Gly Cys Ala Gly Thr Gly Thr Thr Cys Ala Ala Gly Gly Cys
1665   1670   1675   1680

Cys Ala Thr Cys Cys Thr Thr Cys Cys Cys Thr Gly Thr Cys Thr Gly
          1685   1690   1695

Cys Cys Ala Gly Gly Gly Cys Cys Ala Gly Thr Cys Thr Thr Gly Ala
        1700   1705   1710

Cys Gly Ala Gly Thr Gly Thr Gly Ala Ala Gly Cys Thr Thr Cys Cys
      1715   1720   1725

Thr Thr Gly Gly Cys Thr Thr Thr Thr Ala Cys Thr Gly Ala Ala Gly
     1730   1735   1740

Cys Cys Thr Thr Thr Cys Thr Thr Thr Thr Gly Gly Ala Gly Gly Thr
1745   1750   1755   1760

Ala Thr Thr Cys Ala Ala Thr Ala Thr Cys Cys Thr Thr Thr Gly Cys
       1765   1770   1775

Cys Thr Cys Ala Ala Gly Gly Ala Cys Thr Thr Cys Gly Gly Cys Ala
       1780   1785   1790

Gly Ala Thr Ala Cys Thr Gly Thr Cys Thr Cys Thr Thr Thr Cys Ala
      1795   1800   1805

Thr Gly Ala Gly Thr Thr Thr Thr Thr Cys
     1810   1815

10

<210> 3
<211> 11
<212> PRT
<213> Bovine

<400> 3
Glu Thr Pro Val Tyr Leu Gly Ala Thr Ala Gly
 1   5   10

<210> 4
<211> 5
<212> PRT
<213> Bovine

<400> 4
Leu Leu Arg Met Glu
 1   5

<210> 5
<211> 13
<212> PRT
<213> Bovine

<220>
<221> UNSURE
<222> (8)
<223> Xaa, where Xaa = any amino acid

<400> 5
Ala Asp Lys Ile Leu Ala Asn Xaa Val Ala Ser Ser Ile
 1   5   10

<210> 6
<211> 10
<212> PRT
<213> Bovine

<400> 6
Tyr Pro Phe Asp Phe Gln Gly Ala Arg Ile
 1   5   10

<210> 7
<211> 19

<212> PRT
<213> Porcine

<400> 7
Lys Ser Asp Thr Gln Glu Thr Tyr Gly Ala Leu Asp Leu Gly Gly Ala
 1   5   10   15

Ser Thr Gln

<210> 8
<211> 16
<212> PRT
<213> Human and bovine

<400> 8
Lys Ser Asp Thr Gln Glu Thr Tyr Gly Ala Leu Asp Leu Gly Gly Ala
 1   5   10   15

12